

**A Framework for Evaluating User Acceptance of Individual System
Functionalities: A Case Study on the Editor Role for the PUMA Glossary**

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With the rise of the digital workplace and enterprise cloud technologies, the modern corporate intranet has evolved substantially; from a static information hub to a dynamic and interactive ecosystem of applications and services. Prior research has validated the technology acceptance model as a reliable method for evaluating the user acceptance of information systems. However, it is not always practical to evaluate an entire system when feedback on an individual functionality within that system is needed. Established methods for evaluating individual functionalities within information systems remains scarce. This thesis presents the seven-step PUMA user acceptance framework, created to evaluate user acceptance of a current implementation of the editor role for the PUMA glossary, an application within the company global intranet. A SharePoint Site Collection was created for the evaluation environment. A questionnaire containing Likert scale ratings and open-ended questions was used for data and feedback acquisition. A sample of ten participants from the target user group took part in the user acceptance evaluation process. A Top Box report was compiled to communicate the findings, and the open-ended feedback was used for insight to future development. The proposed framework establishes a valid method for acquiring actionable user acceptance data for steering development of individual functionalities within a system for the PUMA IT ecosystem specifically. This thesis provides a foundation on which further research may be conducted to evaluate user acceptance of other system functionalities in the future.

Key words and terms: Intranet, Glossary, User experience, Technology acceptance model

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1. Introduction

As the needs of businesses have evolved in the two decades since the digital intranet concept was first introduced in 1996, the role and scope of intranet services within the digital workplace have changed significantly (Wodehouse, 1997; Mentis, 2016). The principles of user centered design and user acceptance testing have become an increasingly important component of corporate intranets as businesses have begun to focus on not just the public facing experience but also the internal, employee experience (Sikorski, 2006). The modern corporate intranet is no longer a resource-heavy ecosystem of client side applications with passively consumed static content hosted on a company's own servers. For many companies, the intranet is increasingly becoming a cloud-hosted central hub for new-hire onboarding processes, content creation, news updates, employee specific services, communication portals and team collaboration (Jadeja & Modi, 2012). Cloud hosted intranets, provided through platforms such as Microsoft's Office 365, are revolutionizing the workplace further by enabling a global workforce to conduct daily business from anywhere with an internet connection (Diffin, Chirombo, & Nangle, 2010; Lakshman & Thuijs, 2011). New systems and features can be developed and installed in an ad hoc manner within cloud based platforms like SharePoint (Hillier & Pattison, 2013). This means that a company's intranet becomes increasingly specialized to its specific needs over time, shredding the "one size fits all" approach of the past.

Additional advances in information systems (IS) technology and the rise of "Enterprise 2.0" have led to the concept of the "Social Workplace" (Li, 2010). In the social workplace, the intranet contains services with collaborative features and applications like those commonly found in social networking websites (e.g. personal profile management, custom home pages, news feeds, instant messaging and video calling). Social technologies in the workplace enable workers to communicate and collaborate on business objectives across otherwise discrete or distant departments (Sultan, 2013). The social workplace concept has seen increased adoption by businesses as it has been shown to empower employees and increase productivity (Lauby, 2013). Adoption of social technologies in the workplace is not just a trend among business strategists and management; young employees entering the workforce are expecting to use social technologies on the job (Leidner, Koch, & Gonzalez, 2010).

Companies, with a global audience utilizing the social workplace concept, must strategize

accordingly to develop implementation methods to include user feedback and user acceptance testing for use-cases as they are developed. Developing applications and services alongside user feedback enables an organization to predict user acceptance of new systems and functionalities ahead of launch dates, increasing overall user acceptance of services provided and increasing overall business value of the applications within the company intranet (Davis, 1993; Yogesh Malhotra & Galletta, 2004).

Past studies have found the Technology Acceptance Model (TAM) (Davis, 1985) to be a reliable method for predicting user acceptance of new information systems in workplace settings (Horton, Buck, Waterson, & Clegg, 2001; Lee & Kim, 2009). However, these studies providing the foundation for the efficacy of using TAM are evaluating the user acceptance of entire systems, not individual functionalities within those systems. While an entire system approach to evaluating user acceptance can identify different aspects of a system that may lead to user acceptance overall, the user acceptance of individual functionalities within a system is left largely unknown (Thong, Hong, & Tam, 2004). Therefore, the total system approach is not an efficient way to collect actionable insights to steer development of an individual functionality within a system. For this thesis, a PUMA User Acceptance (UA) framework was created to evaluate user acceptance of functionalities **within** an overall system to address this gap.

The framework aims to streamline the process of collecting actionable user acceptance data for use cases that add new functionalities to an overall system. Instead of evaluating the entire system, the framework uses the constructs of perceived usefulness and perceived ease of use from the larger Technology Acceptance Model to evaluate the user acceptance of an individual functionality within a system. This thesis utilizes the PUMA UA framework to collect and evaluate data on the user acceptance of the editor functionality within the PUMA glossary system currently under development.

Participants for the research were selected from the company's COO organization as the first rollout group for the glossary as they work across all departments and areas of expertise. The pilot was conducted first with plans for the broader test including other departments to be administered after the results of this pilot are collected and analyzed for this case study.

1.1. Thesis outline

This thesis contains five chapters. Chapter 2 provides the background and use case for which the framework was created. It begins with an introduction to the role of corporate glossary systems, followed by a brief overview of the SharePoint intranet platform, as it is used to deliver the glossary system for the company. Additionally, the background provides a literature review on the core research used to create the PUMA UA framework; Principles of User Centered Design and the Technology Acceptance Model. Chapter 3 describes how the PUMA UA framework is implemented for the research conducted in this thesis followed by the results and discussion of the findings in Chapter 4. Chapter 5 provides the conclusions and remarks on the research analysis and suggestions for future implementation of the PUMA UA framework.

2. Background

This chapter presents the background of the research in the thesis including an explanation of business glossaries, the intranet platform, a brief overview of SharePoint is included for illustrating the context in which the Glossary system is placed as well as how the collaborative functionalities of the glossary system are accessed and used. Moreover, the core research that forms the foundation for the implementation framework, principles of user centered design and the technology acceptance model, are described.

2.1. What is a business glossary?

A business glossary is the central tool used to provide enterprise-wide terminology within most corporate intranets (Fryman, 2015). The benefits of a corporate glossary within an enterprise include: terminology and definitions for concepts, vocabulary commonly used within the enterprise and minimizing misunderstandings in communication between coworkers and business units (Kremer, Kolbe, & Brenner, 2005). As employees go about their daily jobs, they may encounter terminology that they would either not encounter in day-to-day experiences or experience the use of a term by the organization in an unfamiliar context. The internal business glossary provides a reference for users to check business-approved meanings of terms officially defined by the company. Conducting business with a common understanding of terms enables users to complete their tasks with clarity and efficiency (Fryman, 2008). Additionally, the glossary has the potential to vastly improve the employee onboarding process with the organic submission of terminologies sought after by individuals referencing the glossary when they are new to their jobs. While the benefits may seem obvious, challenges remain for designers and application developers to provide these glossary systems in a way that is easy to use, encourage user engagement, and provide a salient value to the user's daily workflow.

Urban Dictionary defines a glossary as “the thing in the back of the book that teachers torcher students with” (Tupitza, 2010). Indeed, it is all too common for a glossary to be a difficult to read, flat, static list of terms and definitions; something that is not a lot of fun to look at and even less fun to use (reference Figure 2.1.).



	cubes, a reception desk, etc.	
Cap rate	Stands for capitalization rate. This number helps a potential buyer determine the amount of return they will see for a given investment	Using the cap rate allows buyers to compare different investments. Only applies to investment properties.
Certificate of Occupancy	Permission by the government/building inspector to have tenants move into the building	When a new building is completed, the inspector must certify it as safe and up to code.
Class A, B, C	Relative classification of office buildings in terms of finish, amenities and physical attributes	A Class A building will cost more, but will also offer a tenant some increased efficiencies including upgraded wiring, fiber optics, lobbies, etc. Class A properties also have nicer lobbies and shared areas.
Common Area Factor	The common areas of a building are those used by all tenants, such as a lobby, elevator, or hallway. The factor represents the ratio of common areas to total building square footage	The number is used to calculate how much a tenant will pay for their share of a building's upkeep. Tenants occupying more square feet will pay a larger proportion of the common area factor.
Concessions	Discounts given to tenants wither as money off on a lease or free rent, paying moving expenses, etc.	A part of the lease package that helps a tenant compare different lease options. Some concessions are more useful to tenants than others, either by shifting costs farther in the future or paying for large up front expenses.
Condominium	A type of ownership of individual units in a multi-unit structure. Can be a suite, a floor or a section of a building	Offer an opportunity for companies to own their space without having to purchase a whole building or deal with management issues.
Contiguous Space	Means two spaces are adjacent to each other on the same floor or floors directly above or below	Tenants looking for various sizes of space can look for space that is contiguous in the building – they will occupy adjacent floors in the building. Having floors not next to each other is inefficient. This shows a tenant what blocks in a building can be added together or divided to make the necessary square feet for them to move in.

Figure 2.1. An online glossary of a real estate company (Accessed 25 April 2017)

Thus, the user experience of traditional glossary systems leave much to be desired. Users that find a new system difficult to use will increasingly find the system not worth the effort and less likely to return. When a system has low user acceptance, it becomes underutilized within an organization and the resources invested into it are effectively negated (Davis, 1993).

2.2. Intranet platform

The glossary is provided through the company's intranet which is implemented through a Microsoft SharePoint Online as a service deployment. Microsoft SharePoint Online is a web-based collaborative platform integrated with Microsoft's Office 365 application suite. SharePoint Online provides both basic pre-built features as well as can be integrated with custom developed applications ("SharePoint Online," 2017).

2.3. Overview of SharePoint Online

A SharePoint intranet solution typically consists of a Site collection (or multiple Site collections), and Sites within the Site collection (reference Figure 2.2.).

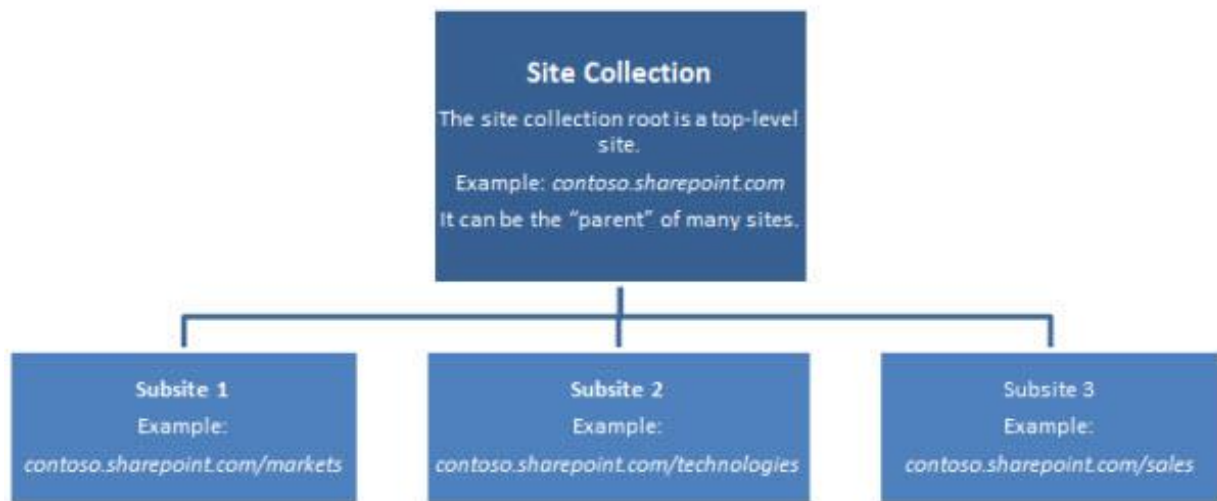


Figure 2.2. A representative graph describing the structure of a SharePoint Online Site collection
(Accessed from ("SharePoint Online," 2017))

2.3.1. Site Collection

The SharePoint Site Collection is the highest-level site acting as the key distributor of individual sites within it. A Site Collection can be configured with permissions that are granted automatically to subsequent individual Sites that are created and populated within it. Different Site Collection strategies exist depending on a company's individual information architecture

requirements. For example, a business might find that their needs can be satisfied by a single Site Collection with individual Sites and Subsites underneath it. However, for larger companies with a global workforce, this approach can become difficult to manage. With a large global workforce, it becomes advantageous to provide an entire Site Collection for more complex use-cases like the Glossary system since it will need to be accessible by all employees in the company (Zelfond, 2015).

2.3.2. Sites

The SharePoint Site is what connects “content, information, and apps” used in the day-to-day workflow (Office Support, 2017). In other words, it is a fundamental element of SharePoint Online. Sites are accessed by users that have been assigned to user groups within the Site. User groups can be individually configured and assigned different permissions reflecting organizational hierarchy, allowing administrators to grant access to site content and features that are most relevant to individual groups (reference Figure 2.3.).

BROWSE

PERMISSIONS

SHARE FOLLOW

Grant Permissions

Create Group

Grant

Edit User Permissions

Remove User Permissions

Modify

Check Permissions

Check

Permission Levels

Site Collection Administrators

Manage

THANK YOU - END

EDIT LINKS

SITE CONTENTS

⚠

Some content on this site has different permissions from what you see here. [Show these items.](#)
There are limited access users on this site. Users may have limited access if an item or document under the site has been shared with them. [Show users.](#)

<input type="checkbox"/>	Name	Type	Permission Levels
<input type="checkbox"/>	Approvers	SharePoint Group	Approve
<input type="checkbox"/>	Designers	SharePoint Group	Design
<input type="checkbox"/>	Hierarchy Managers	SharePoint Group	Manage Hierarchy
<input type="checkbox"/>	New functionalities Members	SharePoint Group	Contribute
<input type="checkbox"/>	New functionalities Owners	SharePoint Group	Full Control

Figure 2.3. a list of site permission user groups within a SharePoint Online site

Pages are the primary component of SharePoint Online sites as they are used to provide the user interface and interactive features for end users. Pages are initially very basic containing only a minimal number of interactive features (reference Figure 2.4.). However, pages can be extensively customized and themed (reference Figure 2.5.) by an enterprise.

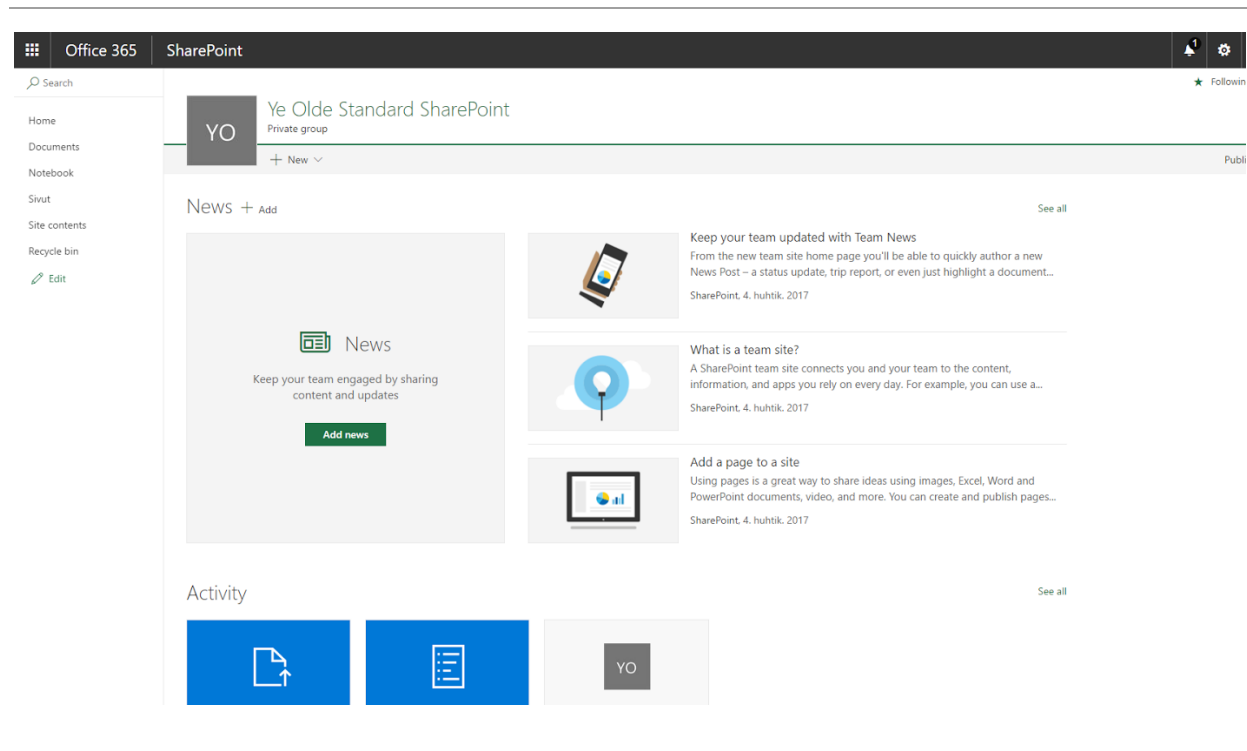


Figure 2.4. a standard, uncusomized SharePoint Online landing page

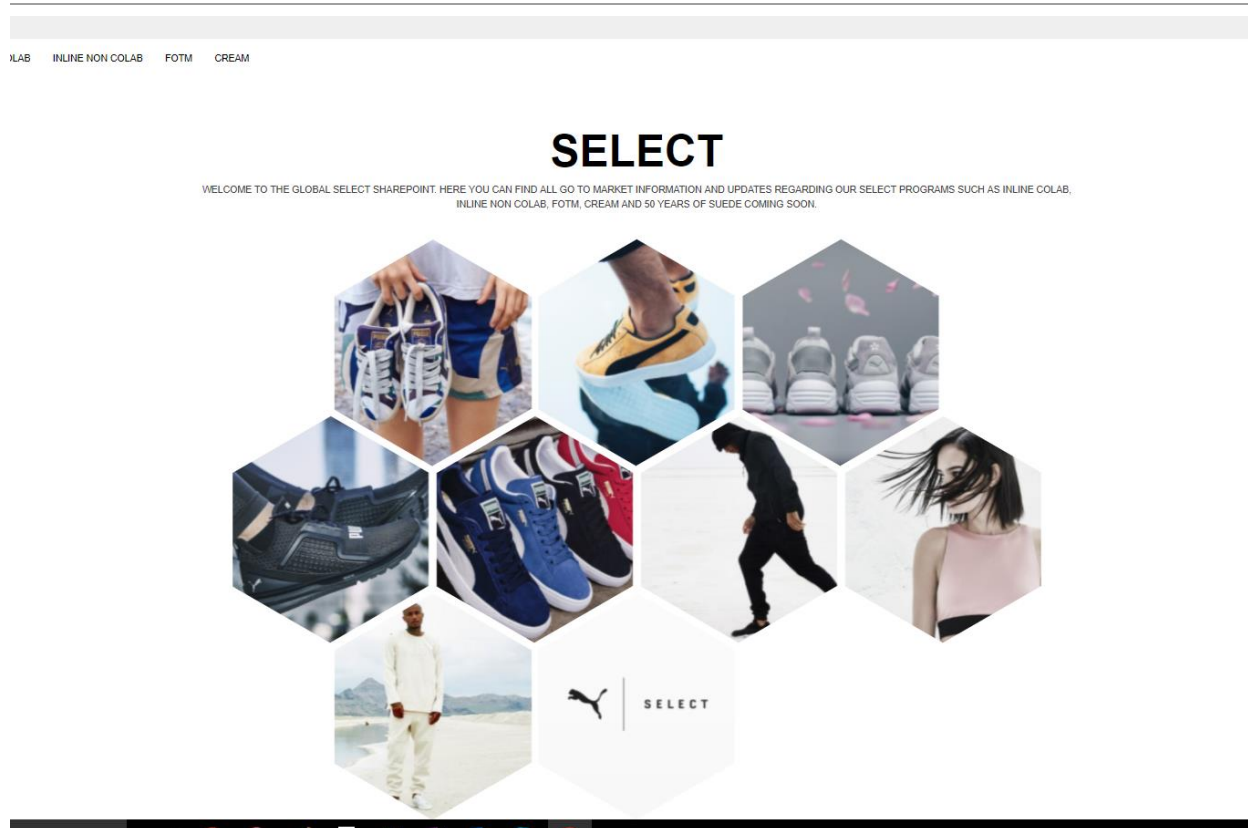


Figure 2.5. A PUMA customized intranet team site landing page (accessed 21st of July 2017)

Content between sites and pages within sites are tied together by SharePoint Search, the built-in search engine. An organization can configure SharePoint Search per their individual use case needs displaying content within specific pages or specific applications for designated user groups (reference Figure 2.6.).

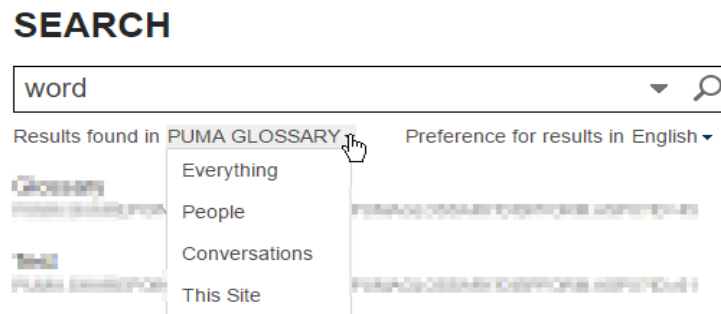


Figure 2.6. A word search using SharePoint Search showing additional options to broaden the search reference (accessed 2nd of June 2017)

The SharePoint Online platform is integrated with Microsoft's other native online applications in the cloud (e.g. Outlook, Teams, Word). This integration within the cloud-based environment provides users the ability to access and manage their individual workflow from any location with an internet connection.

Since it released in early 2013, SharePoint Online has become the leading platform for intranets providing customizable, social workplace services in a cloud-based ecosystem (Hobert et al., 2016; Meske et al., 2017). In addition to the platform being highly configurable and customizable it also allows for a company to develop their own in-house solutions that can then be integrated into their SharePoint Online ecosystem (Hillier & Pattison, 2013). This allows an enterprise to use SharePoint Online as a base for expanding available features and services beyond what is initially included in the service. The PUMA intranet takes advantage of this as it is heavily customized to incorporate features and services (e.g. the PUMA Glossary) developed exclusively for use within the PUMA SharePoint Online ecosystem.

Because of its location in the cloud, the SharePoint Online platform is also scalable (Jadeja & Modi, 2012; Sultan, 2013). If an enterprise's intranet needs change over time, modifications can be made to the service subscription to allow for more storage or additional capabilities and features (Srirama & Ostovar, 2014). Having intranet services located in the cloud allow a company more flexibility in providing more dynamic intranet services and applications

with investment resources that would otherwise be required to maintain additional database hardware management and personnel (Sadiku, Musa, & Momoh, 2014).

2.4. The glossary as one of many collaborative functionalities

Collaborative functionalities in a given system provide users a way to communicate, share, and work on tasks together to produce a product much faster than if those individuals had worked on their own (Horvath, 2001; Lococo & Yen, 1998). For the present thesis, collaborative functionalities are defined as a feature that “provides a unit of information created with two or more individuals”. Information produced this way has multiple avenues available for realizing content creation from content ideation. In the PUMA Glossary, users may submit new suggested terminologies through the interface that are then evaluated and approved, edited, or declined by another user that has been designated as a glossary editor. The glossary editor acts as a gatekeeper to ensure quality and relevance of submitted terminology aligns with business processes. The glossary contains two primary collaborative functionalities: the user submission functionality (briefly described below in subsection 2.4.2.) and the editor role functionality (described in detail in subsection 2.4.3).

2.4.1. The PUMA Glossary

This section provides a brief overview of the glossary available in the testing environment. Additionally, this section describes in greater detail the interaction between the system’s collaborative functionalities unique to this specific use-case

The Glossary system is a custom-coded application residing in a Site Collection where the foundation of the application including the source for its User Interface display is located. The glossary system is accessed only by test users in the current test phase through a beta instance of the PUMA intranet where it can be prototyped in a near-live environment. From the glossary landing page (reference Figure 2.7), a user can search for terms as well as see featured entries, latest entries (entries recently added to the glossary term set) or suggest a new term.

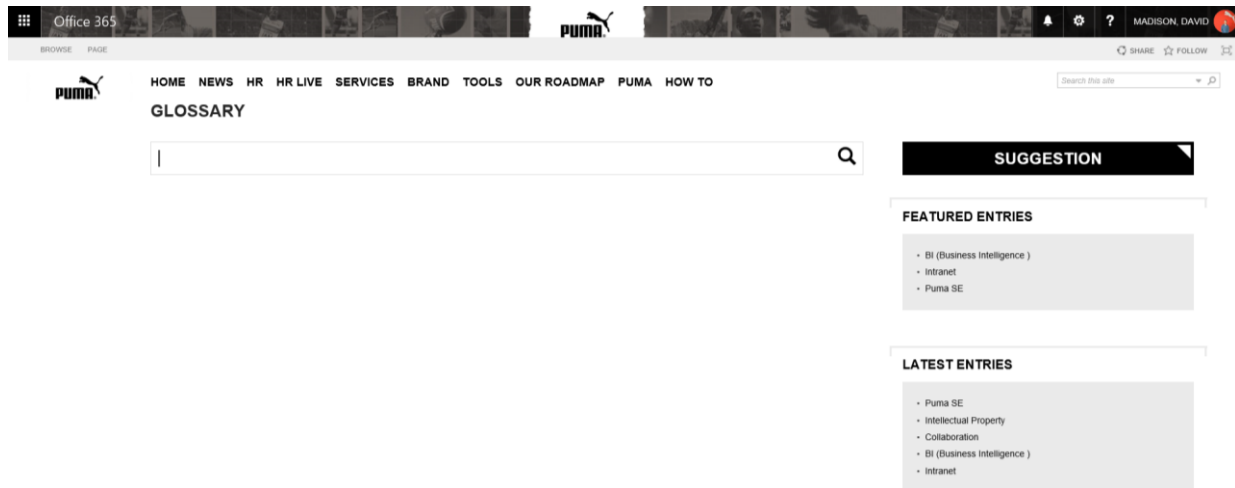


Figure 2.7 the glossary system landing page (accessed 11th April 2017)

2.4.2. User submitted content functionality

To encourage user interaction with the system further than just searching for terms, the glossary provides the ability for users to submit new term suggestions via the glossary interface by:

1. Clicking on the “Suggestion” button (Reference Figure 2.8.)

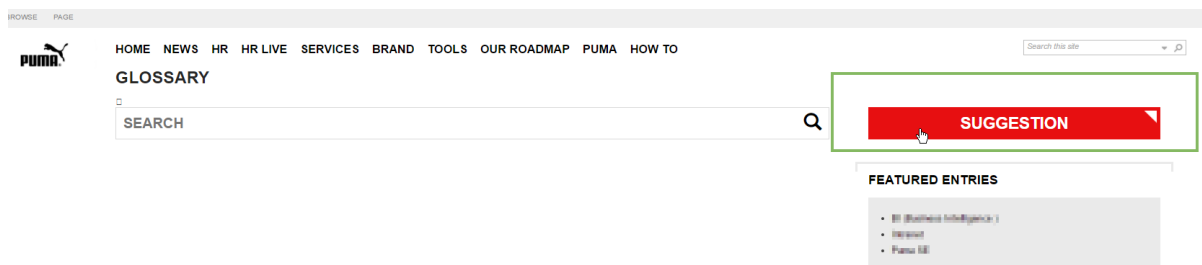


Figure 2.8. the glossary landing page with mouse hovering over the Suggestion button (Accessed 5/12/2017)

In the suggestion interface (reference Figure 2.9.), users are prompted to provide information to the following fields:

- 1.) “**TITLE**” refers to the name of the term being suggested.
- 2.) “**CONTENT**” refers to the definition of the word they are suggesting, or

- 3.) **“GLOSSARY”** clicking this button returns the user to the glossary interface if they change their mind (the “CANCEL” button provides the same function) about submitting a term and wish to return to the Glossary home page.
- 4.) **“SUBMIT SUGGESTION”**: Clicking this button instructs the system to inform an editor of the new submission setting into motion the editor functionality (described in detail in subsection 2.9.).

HOME NEWS HR HR LIVE SERVICES BRAND TOOLS OUR ROADMAP PUMA HOW TO

Search this site

GLOSSARY

NEW SUGGESTION

1

TITLE *

At least two characters are required. (ok)

Microsoft Corporation

2

CONTENT *

At least twenty characters are required. (ok)

A great big corporation with many, many products

(*) Fields marked with * are required!

4

SUBMIT SUGGESTION

CANCEL

3

GLOSSARY

Figure 2.9. the glossary suggestion interface (Accessed 5/12/2017)

The purpose for the submission functionality is to enable users to address for the possibility a certain term or terms may have a significantly different meaning across different departments. For example, the definition of what a “customer” is, which can be a single person or a company of persons depending on the respective department definition of customer. In addition, department leaders may suggest terms to the glossary contextually identified per their interpretation of the word, which, upon approval by the editor, the term becomes available for reference in the glossary for clarification. Furthermore, if a general user identifies a good candidate or candidates for new term suggestions in their day-to-day conversations with colleagues, the user may suggest the terms independently, directly to the glossary themselves. If the suggested term or terms are approved by glossary editors the term is added to the official company lexicon for all to see.

The glossary adds additional value to PUMA through the suggestion functionality enabling users to provide terminology directly relevant to them both in official contexts as well as day-to-day conversations within the company and with greater clarity of meaning with others. While the glossary will initially contain terminology seeded by designated users prior to the system release, going forward, it would not be cost effective for designated users to manually poll general users for submissions every time the glossary needed to be updated. With the suggestion functionality, the glossary can account for situations that may arise where additional relevant terminology may be added organically by users. Users may suggest new terms as they become aware of the need for them without having to store them to submit later or otherwise forget them when the time for a surveyed content submission opportunity would arise.

2.4.3. Editor role functionality

Because new terminology can be submitted by all users, an editor role was needed to act as a gateway and filter to ensure a standard of quality and consistency with term submissions while also avoiding duplicate entries. One of the aims for evaluating the editor functionality is to measure the user acceptance of the editor functionality as it is in its current state. It currently uses default SharePoint Online list alert systems and is not a custom-coded solution. If the current functionality is acceptable for users, it could save the company additional development costs. However, if the current functionality is not acceptable to users or there is a lot of negative feedback for the editor alerts, development resources can be organized to improve user acceptance for the editor functionality. User acceptance by editors is especially important because the editor role functionality is an integral part of the glossary system process in providing content.


To streamline the term quality gate-keeping process, the editor role has a direct relationship with the content that is provided via user submitted suggestions. The editor role is filled by general users with special permissions (Edit permissions granted for the term list). Editors may interact with suggested terms in the following ways:

Approval of terms: terms suggested by users are added to the official glossary lexicon when an editor approves of the submission.

Edit: an editor may evaluate, refine, or change the definition of a term that has been suggested before adding it to the glossary. Editors can also correct for any grammar or spelling mistakes contained within suggested terms before they are approved and appear in the glossary.

Delete terms: in the case of an outdated term or duplicate suggestions that have been submitted, the editor may delete the term or terms.

When a term is submitted by a user through the glossary interface, editors will receive an email alerting them (according to their preferences when the alert was created either they can have submitted terms provided on a daily basis or in a lump on a weekly basis) that the new term has been submitted for review (reference Figure 2.10.) the editor may then click the link “view PUMAGlossary” sending them directly to the list containing all current glossary terms (most recent and unapproved terms appearing at the top (reference Figure 2.11.).

 New term has been added



Madison, David

5/15/2017 12:37 PM

Title: New term

Content: A new term is suggested through the glossary suggestion interface!

Featured: No

PumaGlossaryCategory:

PumaGlossarySuggestionState: review

Suggestion User: Madison, David

Letter: N

[Modify my alert settings](#)

[View PumaGlossary](#)

Figure 2.10. An email alert informing the editor about a new term

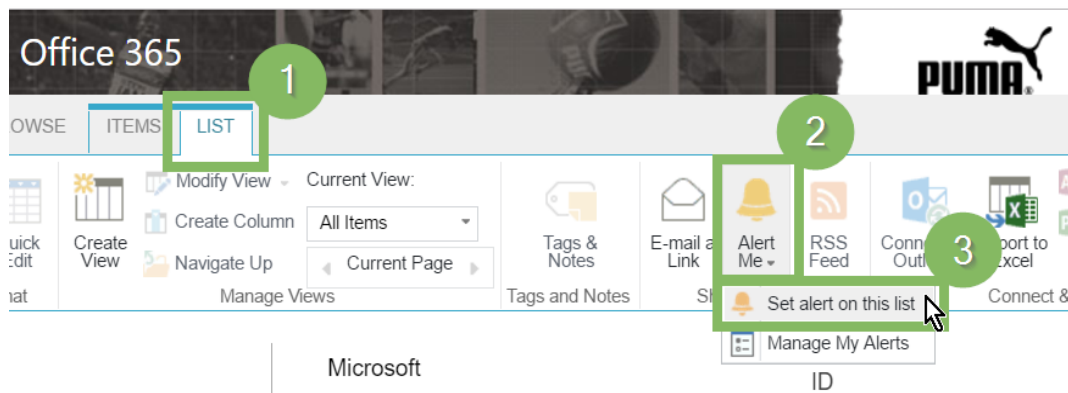


Figure 2.11. The glossary list page within SharePoint where it contains the newly submitted terms for editors to review

Once the editor is directed to the term list page, editors may approve, edit, or delete the suggested terms from the built-in SharePoint Online list function interface. To edit a term, the editor must first click on the term, navigating to the term page, click “edit item” from the SharePoint interface, and provide the information within the Metadata fields for the term (reference Figure 2.12.).

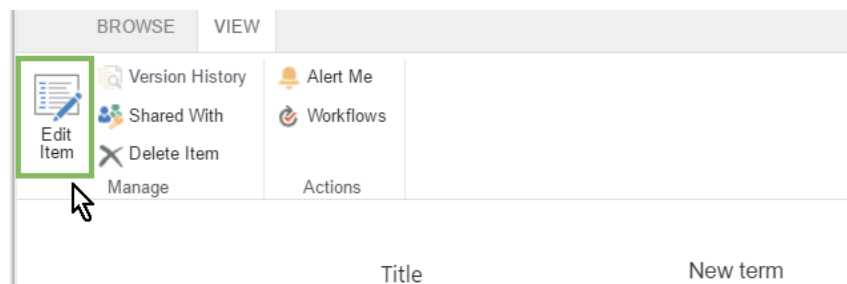


Figure 2.12. the term page, illustrating the placement of the “Edit item” button

Once the editor has set the “PUMAGlossarySuggestionState” to released, and clicked “SAVE”, the term then becomes available in the glossary system for all users to see (reference Figure 2.13.). At any time, an editor can return to terms that have been released and change or alter their attributes. Terms may also be deleted even after they have been saved to the term list (e.g. if the use of a term or group of terms becomes deprecated at a future time).

Language Variant Title

Language Variant Content

PumaGlossarySuggestionState

Suggestion User

CREATED AT 5/15/2017 12:37 PM BY [] MADISON, DAVID
 LAST MODIFIED AT 5/15/2017 12:37 PM BY [] MADISON, DAVID

Figure 2.13. When “PUMAGlossarySuggestionState” is set to “released” the term will be unavailable

2.5. User Centered Design

The concept of ‘user centered design’ was first used by Donald A. Norman, an American research Psychologist from the University of California, San Diego. The goal of user centered design is to deliver a series of principles that aid in developing products considered to have very high usability. User centered design consists of four main principles applied to a rhetorical situation (Norman, 1988; 2016).

The four core principles of user-centered design are:

1. Visibility
2. Accessibility
3. Legibility
4. Language

Visibility refers to a user’s ability to tell from very little exposure to a product what they can and cannot do through interaction with the product.

Accessibility refers to the user’s ability to quickly navigate the contents of a product with clearly labeled buttons or interactive elements and consistent use of interactions providing similar functions.

Legibility refers to the ease of readability and contrast of informational text contained within a product, for example black text on a white background.

Language refers to how the information within a product is provided to a user. For example, omitting unnecessary technical jargon when simpler word choices can be used to communicate the same information.

The **Rhetorical Situation** is a theoretical use case where the previously described principles of user-centered design are applied to the product being examined.

The rhetorical situation is made up of three main concepts:

1. Audience
2. Purpose
3. Context.

The **Audience**, in effect are the users that the product is intended for. An audience is created by the description of demographics such as education, nationality, job title, or department to which they belong in an organization or population demographic subset.

The **Purpose** in the rhetorical situation refers to the problem that the product intends to solve for the Audience. A purpose can be a description of the ways in which a product can be used by the audience, and the intention of the product's use.

The **Context** sets the tone for how the purpose affects the audience. For example, in what situations would the audience use the product and how will the product solve the issue in which it is intended for use.

Utilizing user-centered design as a concept for developing user acceptance testing frameworks gained widespread acceptance and appeal after the publication of Norman's book "The Design of Everyday Things" (Originally titled "The Psychology of Everyday Things") which ties judgments of the design of environmental objects to human psychology explaining how psychological processes are involved in deriving what makes a design essentially "good" or "bad" (Norman, 1988). The principles of user-centered design were quickly applied to information systems and products because information systems have long been tied to human psychology because of the direct influences in how we use and interact with any external stimuli in the outside world (Allen, 1996.; Borlund, 1997; Jank, 2012; Kubie, et al., 1996).

Incorporating user-centered design into an implementation process provides an important framework for optimizing a product or service around how users would naturally interact with the system rather than requiring users to adapt their behavior to facilitate the product (Grudin, 1991). A user-centered design approach to product implementation keeps the user's needs and requirements at the center of design and development decisions throughout the development lifecycle (Göransson, Gulliksen, & Boivie, 2003). A product developed around a user's needs substantially increases user acceptance and subsequent system utilization thus providing greater return on investment resources allocated to the product (Davis, 1993; Gulliksen et al., 2003).

2.6. The Technology Acceptance Model

User acceptance of new information systems is paramount for the adoption and successful rollout of any new IS product. Reliably anticipating user acceptance of new systems as early as possible in the design and development process is key to ensuring investments are maximized for a company (Davis, 1993). Based on psychological principles and human factors research, the technology acceptance model (TAM), developed by Davis (1985) provides a reliable framework in which user acceptance of new information systems can be predicted before resources and time are allocated to system development (Davis, 1985).

The Technology Acceptance Model (TAM, reference Figure 2.14.) is still the most widely accepted model in information technologies for predicting user acceptance and usage of new information systems (Legris, Ingham, & Colletette, 2003; Malhotra & Galletta, 1999; Mathieson, 1991; Marangunić, 2015). The model proposes that application usage can be predicted by factors related to perceived ease of use and perceived usefulness, derived from a rating scale survey (Davis, 1985).

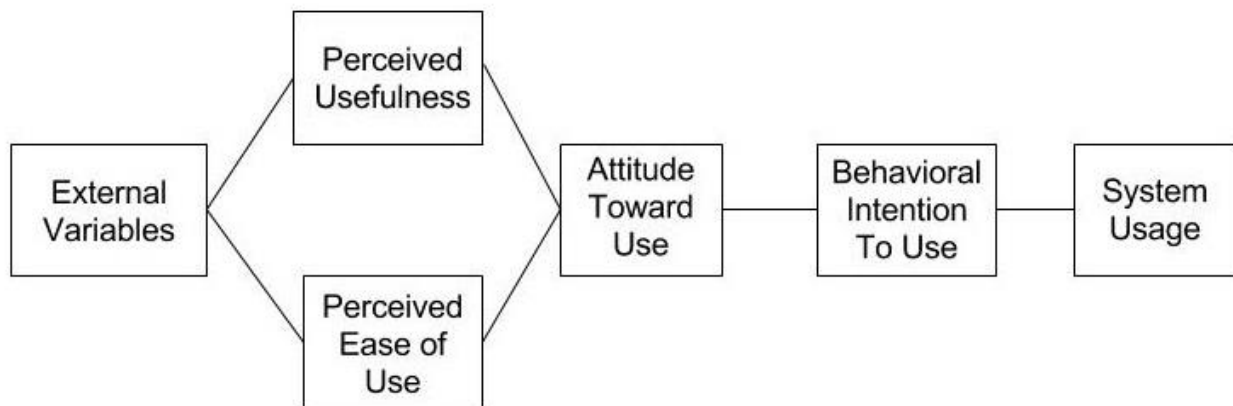


Figure 2.14. the Technology Acceptance Model, adapted from Davis (1985)

The TAM can be administered in a variety of ways and for varying purposes (Marangunić, 2015). Since its conception, TAM has been replicated with consistent and reliable

results in a variety of studies as well as used to evaluate user acceptance of collaborative systems in business contexts (Malhotra & Galletta, 1999). Typically, for products that have not yet been pushed live, TAM can offer insights into user preferences that can be used to empirically communicate change requests to development teams (Davis, 1993). Therefore, using TAM constructs for user acceptance surveys provides insights that in turn can be used to steer development with the user at the forefront of design decisions. Keeping the user in focus throughout the development process results in more usable systems and an increased level of user acceptance for a system. Making iterations based on user feedback and acceptance testing throughout the development process leads to more efficient product development lifecycles (Mayhew, 1999).

For information systems in an intranet, prior research indicates that perceived usefulness is a stronger indicator for user acceptance than perceived ease of use, however, both constructs have a direct effect on user acceptance of new system usage within an enterprise (Lee & Kim, 2009). Therefore, testing for strong user acceptance using constructs of Perceived Usefulness and Perceived Ease of Use within an enterprise framework can be used to further maximize development investment for new systems. Gauging user perceptions of a system can inform designers' and developers' implementation decisions to provide changes and/or additions as needed, before the system is deployed to a live environment (Davis, 1993).

2.7. The PUMA User Acceptance framework

To evaluate new system functionality acceptance for the editor functionality of the glossary system, a method that could be applied to the specific use case of the glossary system editor functionality was created. In addition, the framework must be adaptable for evaluating additional functionalities when needed. To fulfill this need, a seven-step, general framework was created (reference Figure 2.15.).

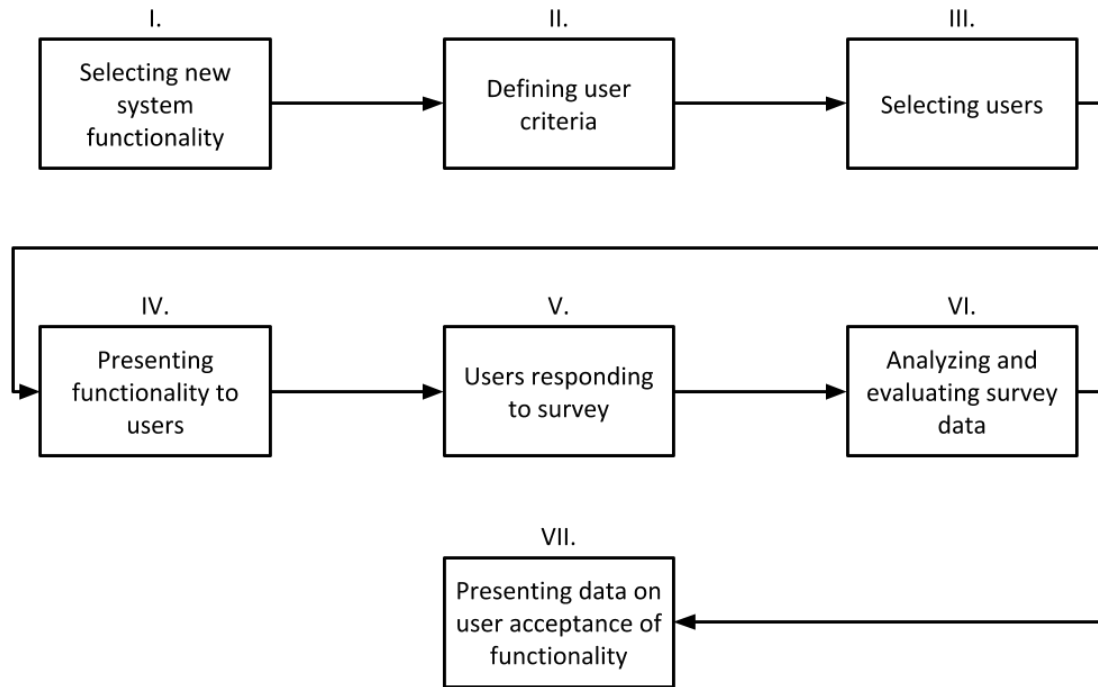


Figure 2.15. the PUMA UA framework process map

The seven-step framework is outlined and explained as follows:

I. Selecting new system functionality:

The new system functionality is selected by the individual tasked with performing the functional testing for a system use case.

II. Defining user criteria:

An analysis of the intended user audience for the new functionality is conducted and user participation criteria is defined.

III. Selecting users:

Users are selected based on the criteria defined in the previous step and sent an email invitation. The email invitation contains a direct link to the site presenting the functionality process.

IV. Presenting functionality to users:

The new system functionality is detailed in an overview format and provided to users through presentation software.

V. Users respond to survey

After the presentation(s), users are directed to a survey application. The survey contains 15 total items. 12 items are Likert scale rating questions and three open ended questions. Likert scale items 1-6 measure the construct of perceived usefulness. Likert scale items 7-12 measure the construct of perceived ease of use. The three open ended questions include one question requesting user opinion on the most positive aspect of the system, one question requesting user opinion on most negative aspect, and lastly one question requesting general comments by the user on the overall system and/or framework. All Likert scale items and the positive and negative open ended opinion questions are required to submit the survey. The general comments open ended question is optional, and does not need to contain information for the user to submit the survey. A survey window timeframe is also defined (e.g. the survey will be available for one week after which the survey is closed and the administrator will proceed to step six).

VI. Analyzing and evaluating survey data:

Once the survey window timeframe has closed, the data is collected and analyzed. The Likert scale ratings are compiled and sorted per their respective construct (PU & PEU). Open ended questions are collected and sorted into positive and negative (per the answers provided by users) and a general feedback pool, then open ended question feedback is categorized by content of the feedback.

VII. Presenting data on user acceptance of functionality

After survey data analysis, the results are compiled into a report and communicated to development and design teams for next steps.

The framework was created following the principles of user centered design as a foundation paradigm for the approach and flow of the steps within it. The Technology Acceptance Model was used for data acquisition within the structure and design of the survey.

In step I, the new functionality that is to be tested for the system is identified and described. The framework keeps the user at the center of the process in the following steps once identifying the new functionality. If a new functionality is part of a system that has not yet been introduced to any user, then an overview introduction presentation to the system should be provided. This can be indicated when identifying the user criteria for the functionality testing during the framework process (e.g. user criteria requires users that are provided an overview of the system before the functionality presentation).

In step II, the user criteria are defined for users contacted to participate in evaluating the functionality. Because users for new system functionalities within an enterprise are the enterprise employees themselves, intended user audiences should be identified as “users that will be or potentially be using the new functionality as part of a system they use in their daily workflow now or in the future”. Therefore, traditional demographics data and user system usage preference do not need to be collected because this information is already available within the company’s internal social networking services (e.g. Delve, Skype).

In step III, users that satisfy the defined user criteria of the previous step are then selected. Because the company uses Microsoft Office 365 services in association with the SharePoint intranet solution, all defined user criteria can be collected from user profiles in Microsoft Delve. At least five qualifying users are sent an email invitation to participate in the survey testing and may access the survey site directly from the emailed invitation. Users are informed that no answer to the survey can be incorrect, no negative consequences will result from participation and their submissions will be safely stored and anonymized.

In step IV, users are guided to the new functionality presentation (or alternatively, a testing environment) within a SharePoint site. The presentation is a brief PowerPoint presentation embedded into the SharePoint page describing the new functionality as it would relate to a user’s workflow within the system. The intended purpose of the new functionality is outlined and the steps involved for a user are explained sequentially leading to the completion of the task addressed by the new functionality.

In step V, users are directed to the survey after reading through the presentation of the new functionality. The survey is a 12 item, seven-point Likert response survey that has standardized wording modeled after items in the technology acceptance model to address perceived ease of use and perceived usefulness. Because of the standardized wording of the survey questions and survey response items, the placement of the system and functionality name has a standard location within the sentence structure of the survey items. Therefore, it can be easily altered in future functionality feedback surveys by simply changing out the system specific words.

In step VI, the framework administrator conducts an analysis on the data collected from the survey. Various data analysis techniques can be used depending on response rates to the survey; however, at least five users from discrete departments should be the aim of user feedback sampling. Therefore, the framework requires at least five users to be selected for response to a

functionality survey. This is not to say that five users should be the end goal sample for the research but rather that at least five of the users are in different organizational departments to ensure a wide range of expertise and user preference feedback is collected for this functionality.

Step VII of the framework guides the framework administrator to compile the data and provide actionable recommendations based on the results collected from user feedback on the functionality. The results and recommendations are then sent to the team leader of the project where a decision on future steps would be made.

3. Methodology

This chapter describes the methods of the research through the lens of the PUMA UA framework. Aligning to the seven-step PUMA UA framework described in the previous chapter, the author details the process of selecting the editor functionality, and defining the user criteria. The user sample is compiled and invited for participation to evaluate the functionality. Following the description of the editor functionality implementation and presentation, the survey creation process is depicted. Finally, the data collection and reporting methods are detailed.

3.1. Selecting a functionality and aim of analysis

The functionality for the editor role was selected for user acceptance evaluation. The editor is a general user, or group of general users that may edit the term list of the PUMA glossary system.

The basic functionality for the editor role may be implemented using standard SharePoint systems requiring no additional development (see Table 1.). However, user acceptance of this approach cannot be assumed.

Basic Function for Editor Role	Corresponding SharePoint system
A notification that a term has been suggested	List alert
A function to approve the suggested term	List item interface
A function to edit the suggested term	List item interface
A function to delete the suggested term	List item interface

Table 1. The editor role functionalities and corresponding SharePoint systems

The aim of this analysis is to evaluate user acceptance of an implementation using standard SharePoint functionalities. In addition, the analysis aims to collect target-group insights to steer development efforts (if needed) of additional functionality for the editor role.

3.2. Defining user criteria

User criteria for the editor role in the glossary is defined as “A general user of the glossary with expertise in terminology of their respective fields”. Therefore, a qualifying user must be within two organizational positions of the global head of their respective department and/or contain the title of “manager” in their profile.

3.3. Selecting users

User profiles within the company’s Microsoft Delve application were cross referenced against the criteria defined in the previous step. The Microsoft Delve application provided the relevant information needed to identify qualifying participants (i.e. organizational chart and displays employee names, department, titles, and contact email) (reference Figure 3.2.).

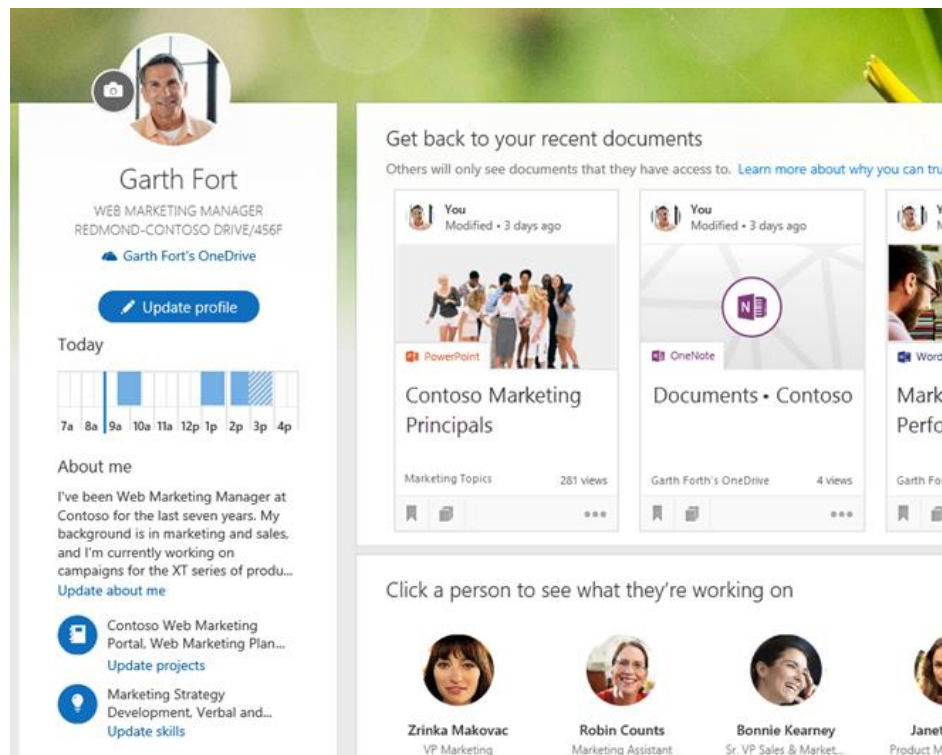


Figure 3.2. Example Microsoft Delve Profile. Contains relevant employee information such as title, department, and contact information (accessed from Office.com).

18 users were assigned to a SharePoint group within the SharePoint Site (named Survey Respondents). The Survey Respondents group was granted “contribute” level permissions to ensure users could access the SharePoint site when receiving the invitation email as well as submit survey responses.

As the company has an international workforce, many of whom English is a second language, the invitation email defined three key words used in the survey (Productive, Efficient and Effective) due to their subtle differences (see Appendix B).

Productive was defined as “Referring to the ability produce an amount of data, or something of value in large amounts.”

Efficient was defined as “Referring to achieving productivity with a minimum amount of wasted effort and expense.”

Effective was defined as “Referring to the successful ability to produce a desired or intended result.

Each user was invited individually by the author using an email template
(See Appendix A).

3.4. Presenting functionality to users

The presentations were created with Microsoft PowerPoint and uploaded to a SharePoint Document Library. The PowerPoints are embedded into a SharePoint Page from their location in the Document Library (Reference figure 3.3).

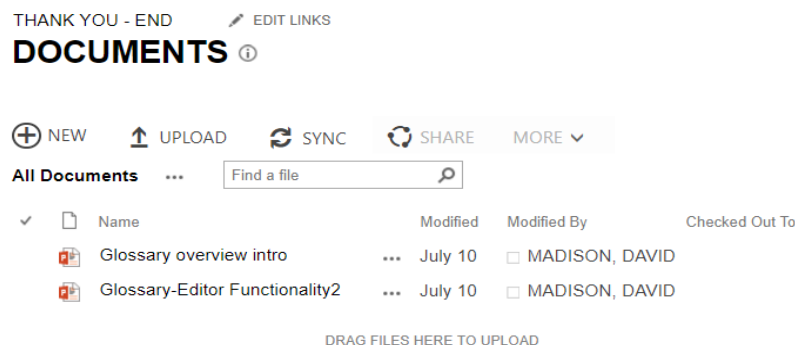


Figure 3.3. Presentations are uploaded to a Document Library to be embedded in SharePoint Pages

When a user clicks the link in the email invitation, they are directed to the introduction page of the New Functionalities SharePoint site (Reference Appendix B). From the introduction page, users may proceed to the Glossary overview presentation by clicking the “CONTINUE” link located at the bottom of the page. Users are instructed to read through the 9 supplied slides embedded within the SharePoint page (reference Figure 3.4.).

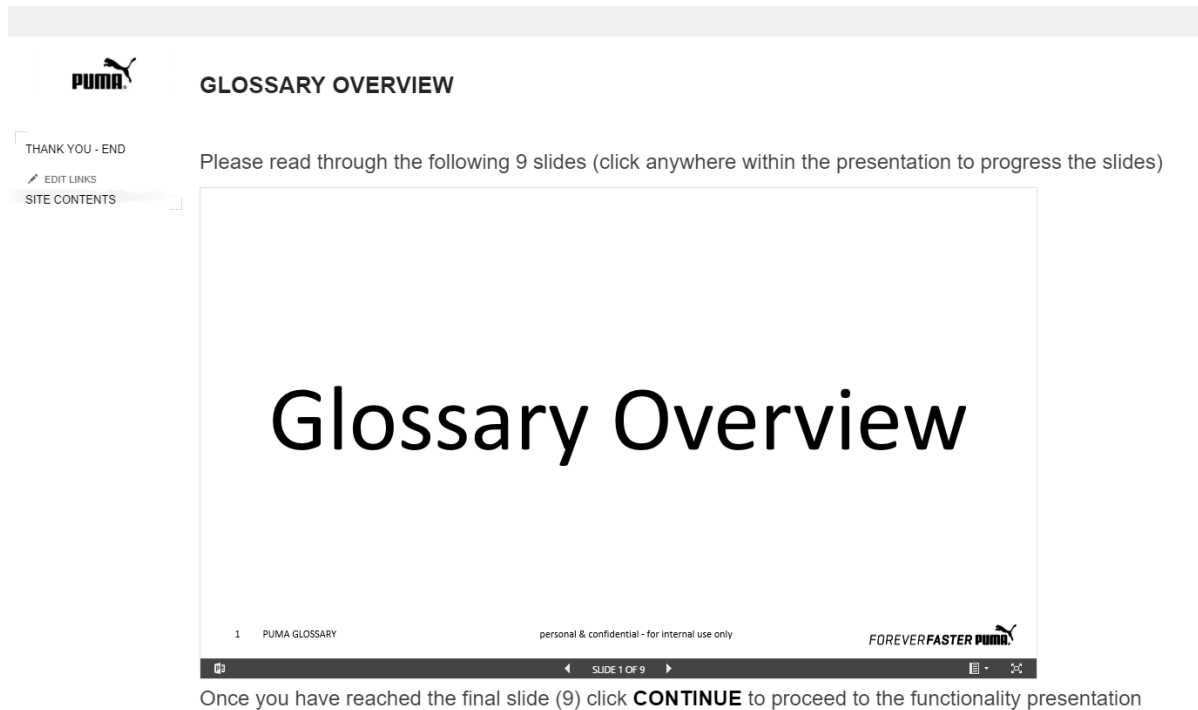


Figure 3.4. The Glossary overview page as seen by users (detailed in full in Appendix C)

The overview presentation provides the user a brief description of basic functionalities of the overall glossary system in nine slides. The Glossary Overview presentation acts to give context to the overall system interaction between general users and editors. Once the user has read the presentation slides, they are instructed to proceed to the following functionality presentation.

3.5. Functionality Presentation

The functionality presentation was created with Microsoft PowerPoint, using nine slides to describe the role of the editor and the functionality as it would be used in its current implementation state (reference Figure 3.5.).

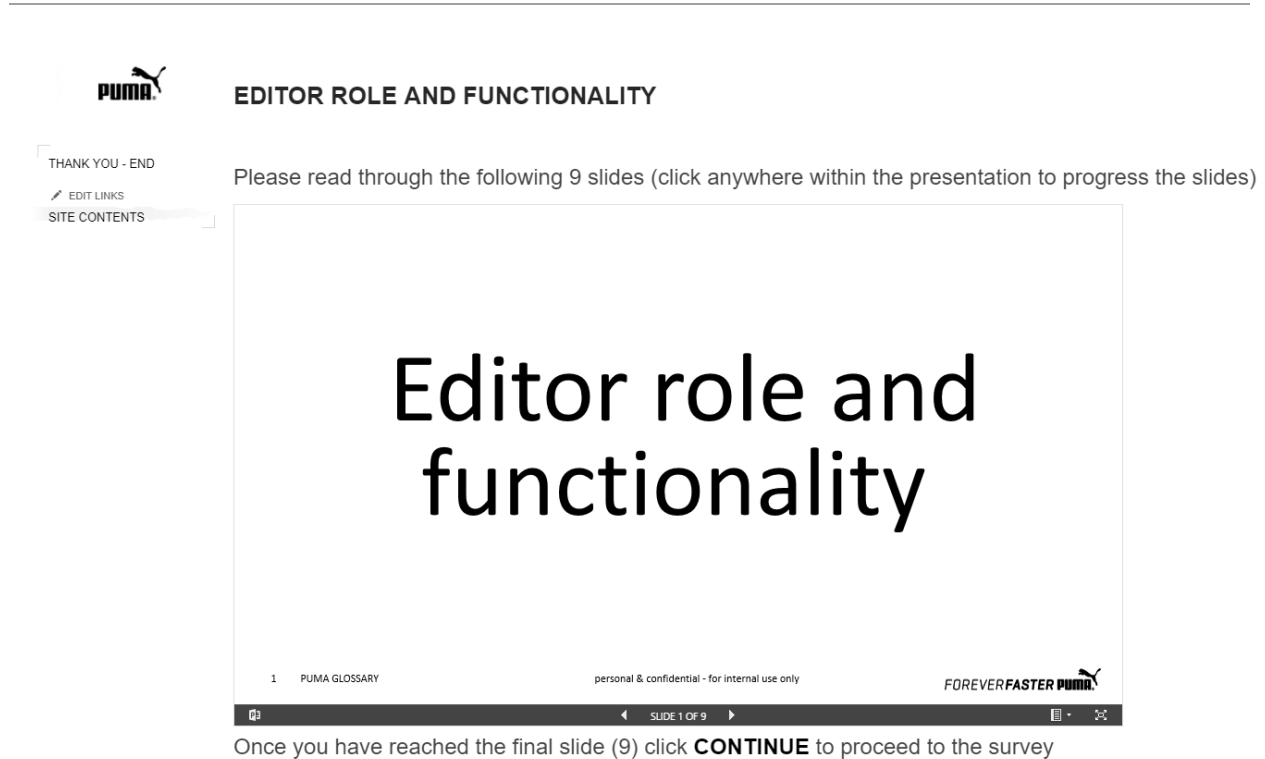


Figure 3.5. The editor role presentation embedded into the SharePoint Page (detailed in full in Appendix D)

The functionality presentation provides a description of the editor process when a new term is suggested to the system. Once the user reaches the final presentation slide, they receive instructions to continue to the survey by clicking the “CONTINUE” button located below the presentation slides.

3.6. Creating the Survey Questionnaire Content

12 Likert scale rating questions and three open-ended feedback responses questions were created for the survey. Questions 1-6 of the Likert scale items measure the construct of perceived

usefulness. Questions 7-12 of the Likert scale items measure the construct of perceived ease of use. Question 13 and 14, the open-ended feedback questions, ask respondents to identify the most negative and most positive aspect of the functionality respectively. Question 15 asks for respondents to provide any general feedback related to the system overall. Questions 1-14 are required to submit the survey. Question 15 is left optional.

3.6.1. Perceived Usefulness (PU)

Defined by Davis (1985) Perceived Usefulness is “the degree to which an individual believes that using a particular system would enhance his or her job performance (Davis, 1985)”. In other words, how useful a user perceives a proposed system and/or the functionality that it provides. Previous research has demonstrated the reliability of using this construct for purposes of intranet system user acceptance (Lee & Kim, 2009). The questionnaire implements six items evaluating this construct by adapting the original scales used by Davis (1985). The endpoints of “likely” and “unlikely” based on a Likert scale rating of 1-7 as in the original Davis scales on predicting user acceptance of new systems is used (see Appendix E.).

The individual question items are framed to ask the extent the user would find a new functionality useful within the current system.

As a content editor for the glossary...

1. Using the editor functionality would enable me to quickly manage suggested terms.
2. Using the editor functionality would improve my performance when managing suggested terms.
3. Using the editor functionality would increase my productivity when managing suggested terms.
4. Using the editor functionality would enhance my effectiveness to manage suggested terms.
5. Using the editor functionality would make it easier for me to manage suggested terms.
6. I would find the editor functionality useful when managing suggested terms for the glossary.

3.6.2. Perceived Ease of Use (PEU)

Referencing Davis (1985) again, Perceived Ease of Use is defined as “the degree to which an individual believes that using a particular system would be free of physical and mental effort

(Davis, 1985)”. In other words, how a user perceives the proposed system and/or functionality to be easy to learn and use. Again, previous research has demonstrated the reliability in using the construct of perceived ease of use to evaluate enterprise information systems (Lee & Kim, 2009). The questionnaire implements six items evaluating this construct adapting the original scales used by Davis (1985). The individual question items for PEU, like PU are framed within the context of the system to ask the extent a user would find the functionality easy to use based on a Likert scale of 1-7. The endpoints of “unlikely” and “likely” are utilized again as in the original Davis (1985) scales (see Appendix E.).

As a content editor for the glossary...

7. Learning to operate the editor functionality would be easy for me
8. I would find it easy to get the editor functionality to do what I want it to do.
9. My interaction with the editor functionality would be clear and understandable.
10. I would find the editor functionality to be flexible to interact with.
11. It would be easy for me to become skillful at using the editor functionality.
12. I would find the editor functionality easy to use.

3.6.3. Positive / negative and open-ended questions

Open ended questions are important both for the usability of a survey and can provide valuable information and feedback that cannot be communicated by Likert scale ratings (O’Cathain & Thomas, 2004). For example, a user could find the functionality both useful and easy to use but also tedious or time consuming, the latter of which could be communicated through the open-ended feedback responses. In this way, open-ended questions serve as an additional reference for making actionable decisions in reporting the data (Renner & Taylor-Powell, 2003).

1. In your opinion, what is the most negative aspect of the editor functionality?
2. In your opinion, what is the most positive aspect of the editor functionality?
3. If you have any additional comments or questions about the editor functionality, please feel free to write them here.

3.7. Survey Implementation

Upon completion of the Functionality Presentation (detailed in section 3.5), users navigate to the survey clicking the continue link located below the embedded presentation on the page.

The survey was available for two weeks. Participant identities were hidden by the SharePoint Survey application but since the application also allows for this setting to be reversed, participant data was collected and coded into an excel sheet to anonymize the data.

The survey application was added to a SharePoint site created specifically for providing the embedded presentations and distributing the survey to users. Individual questions were created within the Survey application which also acts as a repository for the responses submitted to it. Simply linking users directly to the survey application needed to be avoided, because a direct link to the application provides a view of the survey's name, creation time and number of responses, all of which is information irrelevant to participating users (reference Figure 3.6.). To streamline the response submission process and reduce response effort, a link to the survey response page (effectively functioning as a user clicking the “Respond to this survey” button on the application page) needed to be linked directly to bypass the Survey application overview page.

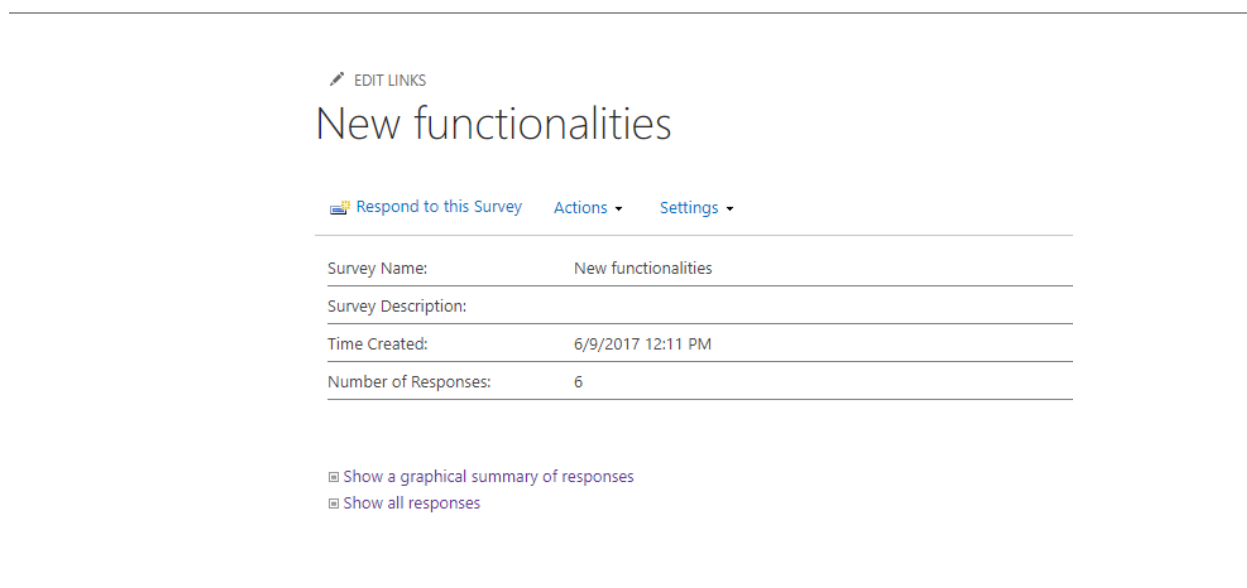


Figure 3.6. the Survey Application Landing Page (which is avoided by linking to the button “Respond to this Survey” instead of linking to the survey application itself.)


Creating an individual question for each PU and PEU item within the Survey application would make the survey's visual presentation to the user overly large spanning multiple pages. This would make the response process too tedious and time-consuming for users. The solution was to provide the general leading statement (“As a content editor for the glossary...”) for each

construct with six sub-questions each. One question would be made for each open-ended response totaling five Survey application questions. (reference Figure 3.7.). Setting the two questions containing the Likert scale rating items to “Required” would be answered if a survey was successfully submitted.

Questions		
A question stores information about each item in the survey. The following questions are currently available in this survey:		
Question	Type of answer	Required
As a content editor for the glossary...	Rating Scale	✓
As a content editor for the glossary..	Rating Scale	✓
In your opinion, what is the most negative aspect of the editor functionality?	Multiple lines of text	✓
In your opinion, what is the most positive aspect of the editor functionality?	Multiple lines of text	✓
If you have any additional comments or questions about the editor functionality please feel free to write them here:	Multiple lines of text	
Modified	Date and Time	
Created	Date and Time	

Figure 3.7. List of questions for the survey in SharePoint

The sub-questions were an efficient solution for fitting questions on a single page (reference figure 3.8.). A dash was placed before the first word of each sub-question in the series to help users differentiate when a new item started in the sequence item placement is presented on the page in a relatively close, and somewhat hard to differentiate manner (reference Figure 3.9.) (recommendations to improve the presentation of question items for future surveys are discussed in Chapter 5).

 EDIT LINKS

Settings ▸ Edit Question ①

Question and Type

Type your question and select the type of answer.

Question:

As a content editor for the glossary...

The type of answer to this question is:

Rating Scale (a matrix of choices or a Likert scale)

Additional Question Settings

Specify detailed options for the type of answer you selected.

Require a response to this question:

☒ Yes ☐ No

Type each sub-question on a separate line:


- Using the editor functionality would enable me to quickly manage suggested terms
- Using the editor functionality would be an efficient way for me to manage suggested terms.
- Using the editor functionality would be a productive way for me to manage suggested terms.
- Using the editor functionality would allow me to effectively manage suggested terms.
- Using the editor functionality would make it easy for me to manage suggested terms.
- I would find the editor functionality useful to manage suggested terms.

A rating scale question consists of a question and sub-questions that are rated on a scale such as 1 to 5. Type a question into the Question box, and then type sub-questions that support the main question. Select a Number Range to define the number of options that users can choose from. The Range Text appears above the option buttons to describe the meaning of the scale, such as Low, Average, and High or Strongly Disagree, Neutral, and Strongly Agree. Use the N/A option if you want users to select N/A or a similar response, if a question is not applicable.

Number Range:

7 ▼

Range Text:

likely  neither unlikely

Show N/A option:

☐


Figure 3.8. The sub questions for the PEU items entered in the SharePoint Survey application

As a content editor for the glossary... *

	likely 1	2	3	neither 4	5	6	unlikely 7
- Using the editor functionality would enable me to quickly manage suggested terms	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
- Using the editor functionality would be an efficient way for me to manage suggested terms.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
- Using the editor functionality would be a productive way for me to manage suggested terms.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
- Using the editor functionality would allow me to effectively manage suggested terms.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
- Using the editor functionality would make it easy for me to manage suggested terms.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
- I would find the editor functionality useful to manage suggested terms.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Figure 3.9. The sub questions for PEU items as they appear to the user

The Survey application page was edited to include brief instructions for users. This was done by “editing” the page within the SharePoint interface and putting a text box above the survey response element containing the text (reference figure 3.10.).

 EDIT LINKS

New functionalities

For the purposes of this survey, imagine that you are a content editor for the glossary right **now**.

You are asked to indicate how likely or unlikely you are to agree with the following statements as a content editor for the glossary.

You can change your answer(s) at any time before you submit the survey.

Once you have completed the survey, please click the "FINISH" button at the bottom of the page. This will submit your answers and then you're done! Thank you!

Figure 3.10. Survey Response page with instructions added

A page was created to communicate to any invited users that had not submitted a survey response by the time the survey response window closed. The homepage was updated with a brief message (reference Figure 3.11.).

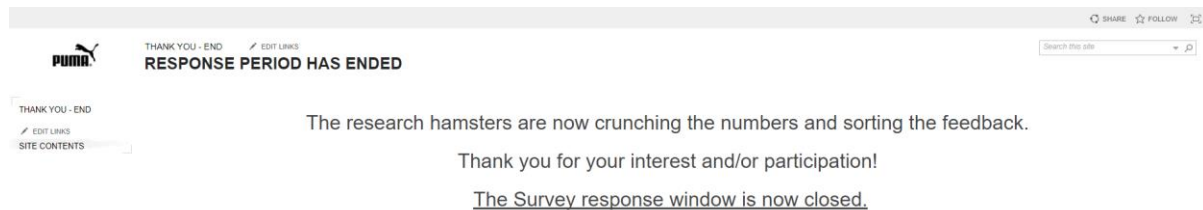


Figure 3.11. Survey response site homepage updated to communicate closure of survey response window to users

3.8. Data Collection

Survey responses for both the Likert scale items and open-ended question items were collected from the SharePoint response page (reference Figures 3.12. and 3.13.). The data was then coded to an Excel sheet for evaluation.

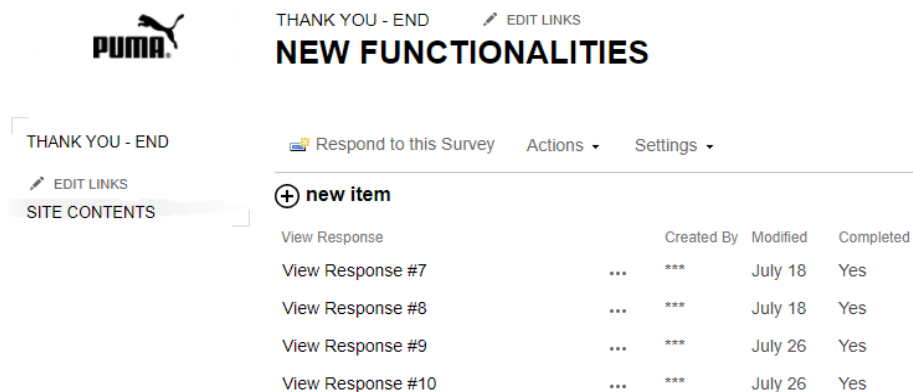


Figure 3.12. Response page

4. Results & Discussion

A total of 11 responses were collected for analysis. Once an initial examination of the data was conducted, one participant had marked all Likert scale items with a score of “4” and placed a single “,” for each required open-ended question. This participant’s data provided no value (other than to suggest the participant wanted to rush through the survey) so it was expunged from the final analysis, resulting in a final dataset of 10 user survey responses. All Likert scale item data (numbers and corresponding items see Appendix F and G, respectively) was compiled into a “Top 3 Box” report for both Perceived Usefulness and Perceived Ease of Use (see Appendix H and I, respectively).

91% of user ratings for the construct of Perceived Usefulness were rated likely above the neutral entry (4). 76% of user ratings for the construct of Perceived Ease of Use were rated as “1” of the three top boxes correlated with “likely” (see Figure 4.1.). An analysis of all ratings for the construct of Perceived Usefulness shows 20% corresponded to the strongest “Likely” Likert rating. All ratings of the construct of Perceived Ease of Use shows 23% corresponded to the strongest “Likely” Likert rating (see Figure 4.2.). These results indicate that the current implementation state of the editor role functionality has both strong perceived usefulness and perceived ease of use by prospective users.

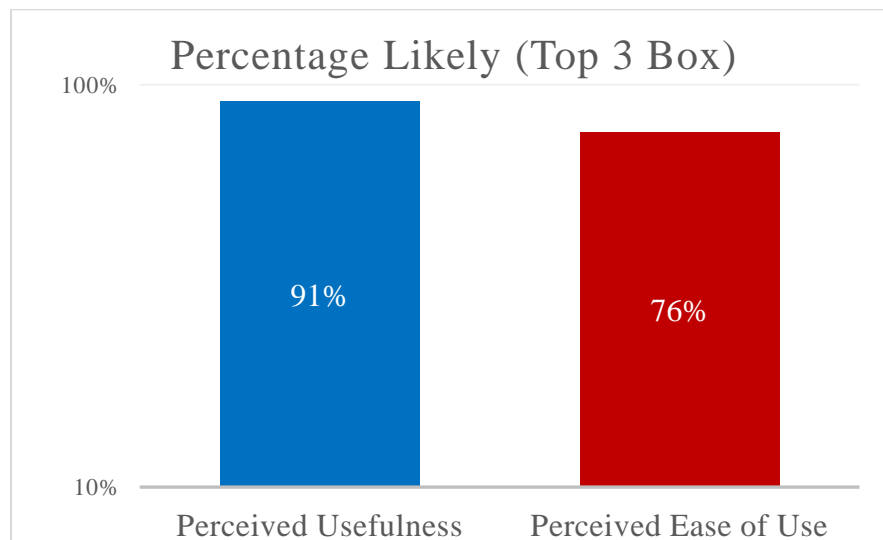


Figure 4.1. Percentage of positive responses by users for the given constructs

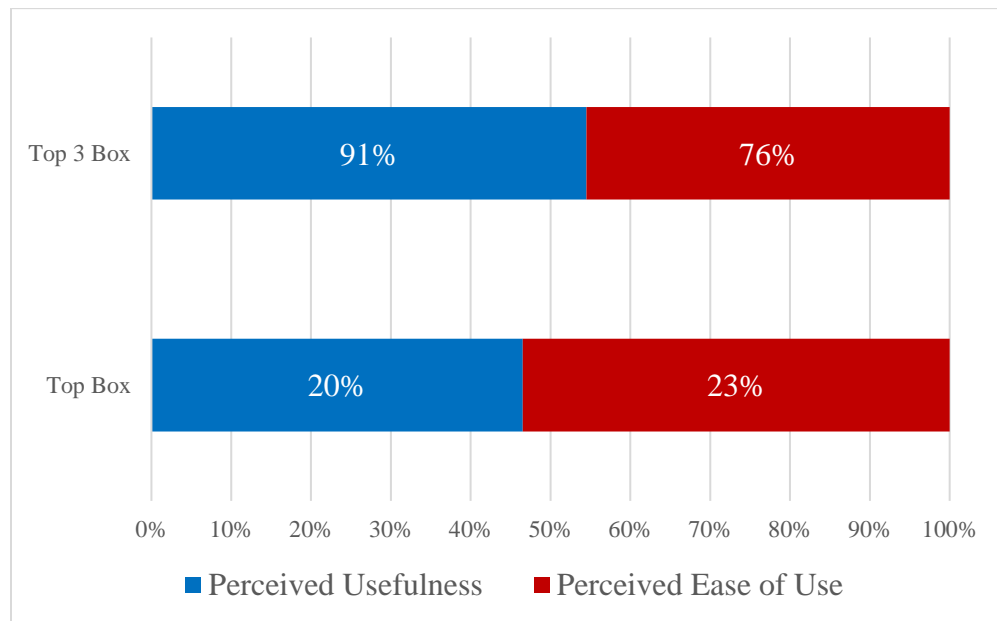


Figure 4.2. Comparing overall positive ratings of Perceived Usefulness (Blue) and Perceived Ease of Use (Red) (Top bar) and overall strongest positive ratings for each construct (bottom bar)

The open-ended questions expectedly provided more detail about the system and functionality overall as well as additional insights that cannot be attained by a Likert scale rating question alone. Per open-ended feedback of users reporting the lowest perceived usefulness, were concerns of time and number of clicks needed to complete the task, as well as the need to learn a new system. Users reporting the highest perceived usefulness indicated the alert for new terms and ability to edit terms as the most positive aspects of the functionality. For users reporting the lowest perceived ease of use, users expressed concern that an editor might make an incorrect amendment to a term if they aren't an expert in the subject pertaining to the term (due to an inability currently for the system to filter specific terms to specific editors) For users reporting the highest perceived ease of use, users identified the editing terms and global accessibility to term lists as the easiest aspects of the current functionality.

The open-ended feedback was first collected and compiled into a list organized by user and category of feedback (negative, positive and general) (reference Table 2.)

User Number	Negative feedback	Positive feedback	General
User 1	No negative aspects.	<ul style="list-style-type: none"> - Update things quickly. - confirm suggested terms 	(No input)
User 2	Nobody knows if the editor is actually an expert in the certain field the glossary entry is linked to. Maybe a requirement for two signatures/approvals would make sense?	<ul style="list-style-type: none"> - That not everybody is able to add new glossary entries randomly - since a looot of abbreviations and special terms are used within PUMA it's a good source to look them up - people might use/define terms differently, the glossary could help to achieve a common understanding for KPI's/terms 	(No input)
User 3	(No input)	(No input)	(No input)
User 4	Learn a new function / platform Are others actually going to use this?	Not sure	(No input)
User 5	-no mass update/overview as compared to excel download for example	-user friendly and effective	(No input)
User 6	This is difficult to say if you haven't tried it yourself...Unfortunately, the slides were too small to be able to see everything correctly. If one term is being edited do other Editors see that or is this term blocked for editing to avoid confusion? Can you see in the Editor who has suggested the term and who has been editing it?	General, it's a great idea to have a PUMA-wide glossary. The Editor seems like a smart and easy way to do the Edits.	<p>Just some general questions that came to my mind:</p> <ul style="list-style-type: none"> - will there be more than one Editor? If yes, do I see who has been editing the term already? - Is it clear which Kind of Edits the editor has to do? Only linguistic changes or also content? I assume the one who is suggesting the term and Definition would be the expert on the Topic. - Do I see already in the info email which Terms have to be

			edited? That would be helpful to see if I'm the right Person who is knowledgeable enough to do Edits in Terms of Content. - One Suggestion: could you add a category to Terms, such as Apparel, Sustainability, Running, Intranet, or anything alike? Would be a good additional Option for filtering entries.
User 7	Wrong amendment of the suggested contents in case of misinterpretation (if there wasn't any feedback requested from author/user)	Quick amendment of the suggested contents if necessary	(No input)
User 8	Cannot edit item right next to the list of items and have to go thru a few clicks / pages	The alert	(No input)
User 9	So far don't see any negative aspects. Would be helpful for us to maintain standard glossary.	Getting definitions and standardized kex figures under control and harmonize the reporting landscape around the globe	Management support needed to make sure that the definitions from the glossary are set and all users around the globe have to follow to use the definitions accordingly.
User 10	Nevertheless how easy it is to operate - time is needed	quick reaction direct opportunity for changes	(No input)

Table 2. Individual User open-ended question feedback

Next, the open-ended response feedback was categorized into four separate groups. Users who gave any general feedback (two users), Users who only provided negative feedback and/or inapplicable positive feedback such as “I don’t know” or “n/a” (one user), users who only provided positive feedback and/or inapplicable negative feedback such as “I don’t know” or “n/a”

(one user), and users who provided both positive and negative feedback but no general feedback (five users) (reference Table 3.). One user submitted Likert scale ratings but no open-ended feedback.

	Percentage averages	
	Perceived Usefulness	Perceived Ease of Use
General Feedback Responses (2)	82%	90%
Only Negative Feedback Responses (1)	71%	57%
Only Positive Feedback Responses (1)	74%	74%
Positive and Negative Feedback with no General Feedback responses (5)	75%	74%

Table 3. Comparison of construct agreement percentage to open-ended feedback responses

The results were compiled into a PowerPoint presentation to demonstrate and communicate the findings to the company. The results indicate user ratings of the current implementation of the glossary editor functionality to be both strong in overall usefulness (92%) and ease of use (76%). Users in general view the functionality to be more useful than it is easy to use in its current state, with open-ended feedback indicating which aspects of the functionality can be improved for greater ease of use. The top box analysis indicates users tend to rate the Perceived Ease of Use items with the strongest likely rating when rating any level of likeliness with the item (20% top box for PU items as opposed to 23% top box for PEU items). When comparing the averages of users' Likert scale ratings with the type of open-ended feedback they provide, users providing general feedback have higher overall averages related to other users. The user submitting only a negative open-ended feedback response found the functionality to be useful but substantially less easy to use than any other user. The five users providing both positive and negative feedback with no general feedback may indicate a contrast between users who are enthusiastic about the system overall (those providing additional, optional, open-ended feedback and rating it higher on

average) and those that provide only required information (those providing both positive and negative open-ended feedback but no additional general feedback). However, due to the limited sample, inferences on the potential correlation of these data points cannot be assumed for application to broader populations within the workforce.

4.1. Improvement recommendations

The following improvement recommendations were created from the author's experience in conducting the pilot research and the content provided by users to the open-ended questionnaire feedback. Recommendations are first sorted per an overall category. Within the category, a statement of the discovered problem is detailed and a recommended solution is provided.

1. Questionnaire Look & Feel

Problem Statement: Creating the survey with the standard SharePoint Survey application is time consuming and presents additional challenges in the visual representation of questions and response items in a user-friendly manner.

Recommended Solution: Microsoft Forms was recently announced and should be used for administering future surveys. This new application is integrated into the Office 365 platform, provides a modern user interface, streamlines the survey creation process and can be embedded directly into SharePoint Online pages ("What is Microsoft Forms?" 2017).

2. Indicating term area of expertise

Problem Statement: Editors are not experts in all business areas and need a way of knowing if a suggested term is intended for their area of expertise.

Recommended Solution: Add a form field within the suggestion interface to enable users to select from a list of available areas of expertise when submitting a term.

3. Effort required by editors

Problem Statement: In the current implementation, editors receive an email notification, and then must navigate to the term list to manually edit metadata fields of individual terms.

Recommended Solution: Implement automated workflow processes to reduce the number of steps involved when editors approve or reject suggested terms.

5. Conclusions

This thesis introduced the PUMA UA framework, a method enabling user researchers to evaluate user acceptance of individual functionalities within a system. It was used to evaluate the user acceptance of the editor role functionality for the PUMA intranet glossary system currently in development. This chapter reiterates the aims of the framework described in the introduction and reflects on the results concluding strong evidence of the efficacy of the framework.

The PUMA UA framework streamlines the process of collecting actionable user acceptance data and user-insights to steer development considerations for individual functionalities of a system. The PUMA UA framework achieves this goal through a dynamic, user-centered approach using established evaluation methods of the technology acceptance model. A researcher may adapt the questionnaire content to any future or present system / functionality combination by simply changing the standardized wording of the Likert scale items, and embed relevant, brief PowerPoint presentations into a SharePoint page within a SharePoint Site Collection. Target groups are easily identified and participants are recruited quickly due to the company utilization of the various Microsoft Office 365 services integrated into the SharePoint Online platform (e.g. Outlook, Delve).

It should be noted that the PUMA UA framework processes and steps may not be universally applicable outside of PUMA's information system infrastructure, for which it was exclusively developed and deployed. Many alternative intranet platforms could be utilized by other companies rendering the above framework incompatible or ineffectual. Therefore, this case-study may only be used as a starting point for the general efficacy of evaluating user acceptance of individual functionalities outside of PUMA. In addition, it could be that the individuals within the COO organization are especially motivated to respond to operational surveys and provide actionable feedback for the ongoing development of a future system, whereas users in other organizational departments may not.

The limitations of this study do not, however, detract from the business value of the PUMA UA framework for which it was developed. As additional functionalities and features are considered for future systems, the PUMA UA framework has established a foundation from which further development insights may easily be communicated and realized within the PUMA intranet ecosystem.

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Appendices

Appendix A

Hello [Name],

I am a master thesis project intern with the business support applications team. I am currently running a pilot of a new framework for evaluating new system functionalities. In addition, I am writing my master thesis on this concept.

You have been invited to participate because the current pilot is being conducted within the COO organization first.

The research process simply includes a brief overview of the system, an explanation of the functionality and then answering a short survey. The expected time to completion is ~10 minutes.

For purposes of the research it is important to clarify how the following terms will be used:

“**Productive**” refers to the ability to produce an amount of data, or something of value in large amounts.

“**Efficient**” refers to achieving productivity with a minimum amount of wasted effort and expense.

“**Effective**” refers to the successful ability to produce a desired or intended result.

An introduction page explaining in greater detail is provided on the site itself.

You can find the site at the link here:[Link]

Thank you!

Appendix B

Introduction

I am David Madison, currently writing my master's thesis with the Business Support Applications team within the IT department under the guidance of Michaela Meusel. I am developing a framework in which to evaluate user acceptance of new functionalities for new applications and systems. On this page I will provide to you an overview of the work and how you will proceed through to the survey.

Purpose of the research

The purpose of the research is to gather feedback for an editor functionality for a new Intranet Glossary system. Using a research framework based on user centered design and the technology acceptance model. Feedback from this research will guide the development of the editor functionality for the new Puma Glossary as well as provide insights for future work.

Participant Selection

You have been invited to take part in this research because we feel that your experience with the company can contribute valuable insights to the editor functionality for the glossary system.

Procedure overview

- When you click the CONTINUE button at the bottom of this page, you will be provided a brief overview presentation of the glossary system itself and how the Editor functionality comes into play.
- From there (reminders will be provided) you will continue to a presentation on the editor functionality itself.
- Once you have read through the slides of the editor functionality you may then proceed to the survey.
- The survey contains 12 Likert Scale questions and 3 open ended questions for additional feedback.
- Once you submit your answers that's it! You're done.

Confidentiality

Survey responses are protected and your individual information will not be collected or provided to anyone for any reason.

Right to refuse or withdraw at any time

It is your right as a participant that you may stop participating at any time and withdraw from the research with no penalty or questions asked.

Who to contact

The content of the questions in the survey has been approved by the Worker's council on 6th of July, 2017. If you have any questions please contact [name redacted] or [name redacted].

Once you have read and understand the above information please click [Link redacted] to proceed to the overview presentation page.

Glossary Overview

The Glossary

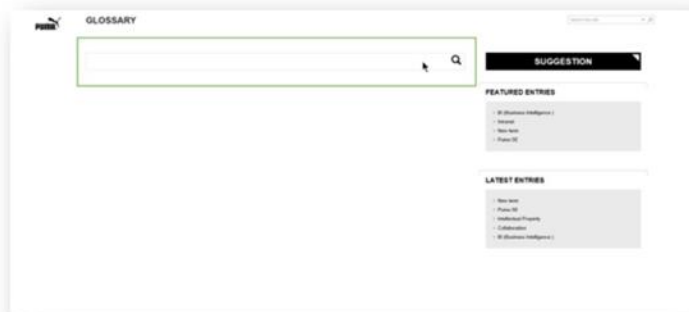
- The Glossary is intended for two main user bases:
 - General users
 - General users are defined as any user within Puma's global workforce with access to the Future Workplace.
 - Content editors
 - Content editors are general users that have been designated as an editor with authority to approve of, edit, or deny terms suggested by other general users.

Function overview for general users

- The Glossary system has the following 5 main features within the user interface
 - Term search
 - Term filtering
 - Suggesting new terms
 - Featured Entries
 - Latest Entries

Term search

- Terms can be searched by traditional means through the search bar



Term filtering

- Once a search has been conducted, the search results can be filtered for accuracy
- Results can also be filtered by letter.



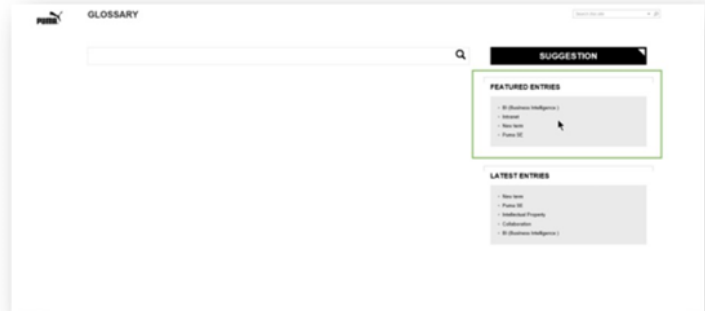
Suggesting new terms



- Suggestions for new terms can be provided by the clicking the "SUGGESTION" button
- Then, users may provide the new term, its definition and then submit it for a content editor's review by clicking "SUBMIT SUGGESTION"

Featured entries

- New entries can be tagged as “Featured” and are seen here on the glossary home page for a period of time.



That's all for the overview. Onward!

Please proceed to the functionality presentation (by clicking the “**CONTINUE**” button below this slide)

Editor role and functionality

1 PUMA GLOSSARY

personal & confidential - for internal use only

FOREVER FASTER 

Editor functionality Presentation overview

- The following slides will...
 - Introduce the role of the editor for the glossary system.
 - Describe the functionality for approving, editing, or deleting new suggested terms.

2 PUMA GLOSSARY

personal & confidential - for internal use only

FOREVER FASTER 

Editor functionality

The role of editors

- Editors have the following authority over content suggested by users:
 - **Approval:** terms suggested by users are then added to the glossary.
 - **Edit suggested terms:** editors may evaluate or change the content of terms that have been suggested before they approve the term.
 - **Delete terms:** duplicate suggestions or suggestions that are deemed not relevant can be deleted.

Editor functionality

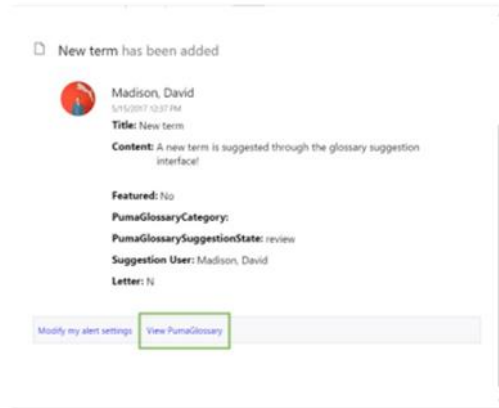
Receiving alerts for suggested terms

- Whenever a new term is submitted, the editor receives an alert to their email.
- The following slides describe the process of receiving email alerts and the steps needed in order to approve, edit, or delete suggested terms.

Editor functionality

Receiving alerts for suggested terms

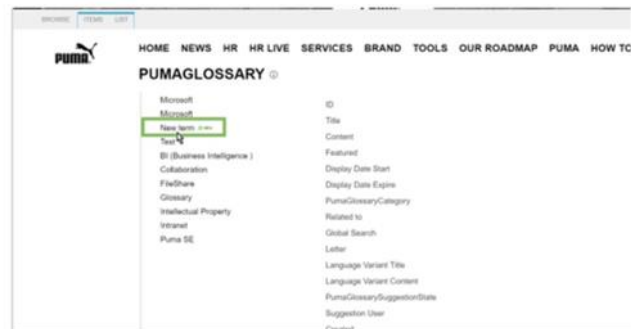
- When an email alert arrives, you can immediately access the list containing the suggested term by clicking “View PumaGlossary”.



Editor functionality

Managing suggested terms

- The most recently suggested terms appear on the left hand side of the page and are listed in alphabetical order.
- Click on the term you want to approve, edit, or delete. (clicking a term will direct you to that term's page).



Editor functionality

Managing suggested terms

- From the top of the term page click “Edit item”.

Editor functionality

Managing suggested terms

- Provide or edit the properties of the term.
- When you are ready to publish the term for all general users, change the field of “PumaGlossarySuggestionState” from “review” to “released”
- Click “SAVE”.

Editor functionality

Completion

The new term has been approved and released to the glossary!

Please now proceed to the survey by clicking the “**CONTINUE**” button below this slide.

Appendix E

Thank you - End

 [EDIT LINKS](#)

New functionalities

For the purposes of this survey, imagine that you are a content editor for the glossary right **now**.

You are asked to indicate how likely or unlikely you are to agree with the following statements as a content editor for the glossary.

You can change your answer(s) at any time before you submit the survey.

Once you have completed the survey, please click the "FINISH" button at the bottom of the page. This will submit your answers and then you're done! Thank you!

[illegible]

As a content editor for the glossary.. *

	likely 1	2	3	neither 4	5	6	unlikely 7
- Learning to operate the editor functionality would be easy for me.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
- I would find it easy to get the editor functionality to do what I want it to do.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
- My interaction with the editor functionality would be clear and understandable.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
- I would find the editor functionality to be flexible to interact with	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
- It would be easy for me to become skillful at using the editor functionality.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
- I would find the editor functionality easy to use.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

In your opinion, what is the most negative aspect of the editor functionality? *

In your opinion, what is the most positive aspect of the editor functionality? *

If you have any additional comments or questions about the editor functionality please feel free to write them here:

Finish

Cancel

Appendix F

Perceived Usefulness	
• Item 1	Using the editor functionality would enable me to quickly manage suggested terms.
• Item 2	Using the editor functionality would improve my performance when managing suggested terms.
• Item 3	Using the editor functionality would increase my productivity when managing suggested terms.
• Item 4	Using the editor functionality would enhance my effectiveness to manage suggested terms.
• Item 5	Using the editor functionality would make it easier for me to manage suggested terms.
• Item 6	I would find the editor functionality useful when managing suggested terms for the glossary.

Appendix G

Perceived Ease of Use	
• Item 7	Learning to operate the editor functionality would be easy for me.
• Item 8	I would find it easy to get the editor functionality to do what I want it to do.
• Item 9	My interaction with the editor functionality would be clear and understandable.
• Item 10	I would find the editor functionality to be flexible to interact with.
• Item 11	It would be easy for me to become skillful at using the editor functionality.
• Item 12	I would find the editor functionality easy to use.

Appendix H

Perceived Usefulness						
	Item 1	Item 2	Item 3	Item 4	Item 5	Item 6
User 1	3	3	2	3	3	3
User 2	3	3	3	4	2	2
User 3	1	1	1	1	1	1
User 4	1	4	4	1	4	4
User 5	1	1	6	1	2	2
User 6	2	2	3	2	2	1
User 7	2	2	2	2	2	2
User 8	4	4	5	2	3	2
User 9	3	3	2	3	2	2
User 10	2	4	3	2	5	3
Top Box	3	2	1	3	1	2
Top Two Box	6	4	4	7	6	7
Total Likely (out of 10)	9	7	7	9	8	9
Top Box	3	2	-1	3	0	2

Appendix I

Perceived Ease of Use						
	Item 7	Item 8	Item 9	Item 10	Item 11	Item 12
User 1	2	2	2	3	4	4
User 2	1	1	2	3	3	1
User 3	2	1	2	1	2	2
User 4	4	4	4	4	4	4
User 5	1	2	1	5	1	1
User 6	1	1	2	3	1	1
User 7	4	4	4	4	4	4
User 8	2	2	2	4	2	2
User 9	2	2	2	2	2	1
User 10	3	3	4	3	5	5
Top Box	3	3	1	1	2	4
Top Two Box	7	7	7	2	5	6
Total Likely (out of 10)	8	8	7	6	6	6
Top Box	3	3	1	0	1	3